SINFONIA

REVOLUTIONISING CANCER CARE WITH PRECISE RADIATION RISK ASSESSMENT

sinfonia-appraisal.eu

SINFONIA

SINFONIA develops novel methodologies and tools that provide a comprehensive risk appraisal for detrimental effects of radiation exposure on patients, workers, the public, and the environment during the management of cancer patients.

OBJECTIVES

- Develop dose estimation tools based on personalised dosimetry methods, advanced computational tools, powered by artificial intelligence (AI)
- Perform research on individual sensitivity to radiation and susceptibility to Second Malignant Neoplasms (SMN) for risk appraisal in medicine
- Develop a novel patient radiation risk appraisal tool and estimate uncertainties
- Conduct research to support radiation risk appraisal for staff, comforters, the public and the environment
- Develop and operate a platform for dose, imaging and non-imaging data
- Provide multidisciplinary education and training

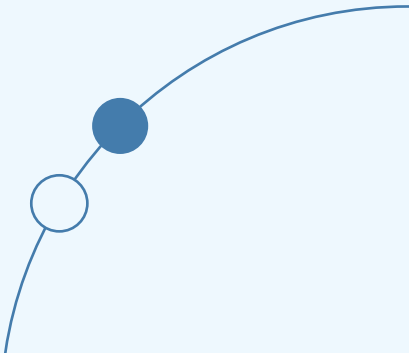
CONSORTIUM

The multidisciplinary SINFONIA consortium combines the expertise of 14 partners from 8 countries. It includes major universities, research institutes, hospitals and industry partners.

RADIATION RISK APPRAISAL FOR DETRIMENTAL EFFECTS FROM MEDICAL EXPOSURE DURING MANAGEMENT OF PATIENTS WITH LYMPHOMA OR BRAIN TUMOUR

FIRST RESULTS

- An AI-powered web-based toolbox (i-Dose) for estimation of organ doses from X-ray examinations as well as a sophisticated tool for multi-organ segmentation of CT total body scans were developed.
- A transformer-based deep learning model for voxel-level dosimetry in ^{177}Lu-DOTATATE therapy was trained with Monte Carlo simulations.
- Out-of-field doses during the treatment of Hodgkin lymphoma and brain tumour patients receiving photon and proton treatments were evaluated.
- A data repository to share information and the developed AI algorithms was created.
- The impact from the release of radiopharmaceuticals on humans and the environment was evaluated.
- Blood samples to determine variability in radiotherapy-induced mutations were collected.
- A survey on education and training in dosimetry, radiobiology and radiation protection was conducted, and training courses were also organised.
- An AI-assisted system for real-time staff dose assessment in nuclear medicine is under development.
- An international multicenter measurement campaign on staff doses in nuclear medicine was finalised to analyse the occupational dose contributions specifically from ^{68}Ga, ^{177}Lu and ^{131}I.
- An advanced computational framework was developed and benchmarked to estimate the doses to caregivers or family members from nuclear medicine patients in close-contact scenarios.



SINFONIA

PROJECT FACTS

Coordinator:	European Institute for Biomedical Imaging Research (EIBIR), AT
Duration:	48 months
Runtime:	1 September 2020 – 31 August 2024
Total EU Funding:	€ 5,999,998.75
Project Manager:	Ulrike Mayerhofer-Schirmer European Institute for Biomedical Imaging Research (EIBIR), AT umayerhofer-schirmer@eibir.org
Scientific Coordinator:	Prof. John Damilakis University of Crete (UoC), GR

This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 945196.

Find out more at
sinfonia-appraisal.eu